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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,667	12/28/2001	Seung-Kyu Choi	3430-0172P	3666

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
LANDAU, MATTHEW C	
ART UNIT	**PAPER NUMBER**
2815	

DATE MAILED: 11/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/028,667	CHOI ET AL.	
	Examiner	Art Unit	
	Matthew Landau	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-21* is/are pending in the application.

4a) Of the above claim(s) *15-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claims 4 and 7 are objected to because of the following informalities: there is insufficient antecedent basis for "the gate electrode" and "the second storage electrode". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Akamatsu et al. (US Pat. 6,414,730, hereinafter Akamatsu).

In regards to claim 1, Figures 1 and 7A of Akamatsu disclose an array substrate for a liquid crystal display device, comprising: a substrate 51; gate and data lines (60 and 61) crossing each other on the substrate; a thin film transistor connected to the gate and data lines, the thin film transistor having a semiconductor layer 54, and source and drain electrodes (58 and 59) facing and spaced apart from each other; a passivation layer 68 over the gate and data lines and

the thin film transistor, the passivation layer having a contact hole exposing a portion of a side surface of the drain electrode; a gate insulation layer 53 formed underneath the passivation layer 68, wherein the contact hole is defined through the passivation layer and the gate insulation layer; and a pixel electrode 69 on the passivation layer.

In regards to claim 2, Figure 7A of Akamatsu discloses the pixel electrode is electrically connected to the drain electrode through the contact hole, and also contact the substrate through the contact hole.

In regards to claim 5, Figure 7A of Akamatsu discloses the contact hole further exposes a portion of a top surface of the drain electrode.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu in view of Han et al. (US Pat. 5,926,235, hereinafter Han).

The difference between Akamatsu and the claimed invention is a storage capacitor including a first storage electrode, a portion of a gate insulation layer, and a second storage electrode, wherein the first storage electrode is formed of the same material as the gate electrode and the second storage electrode is formed of the same electrode material as the source and drain

electrodes. Figure 5I of Han discloses an array substrate with a thin film transistor and a storage capacitor. Figure 5I of Han discloses the storage capacitor includes a gate insulating film 109, a first storage electrode 117, and a second electrode 130, wherein the first storage electrode is formed of the same material as a gate electrode 107, and the second storage electrode is formed of the same material as a source and drain electrodes (105 and 106) (column 4, lines 1-22). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Akamatsu by including the storage capacitor of Han for the purpose of increasing the response time of the pixels by allowing localized signal storage.

Claims 6-9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US Pat. 6,091,466, hereinafter Kim'466) in view of Lyu.

In regards to claims 6, 8, 9, and 12, Figures 4 and 5F of Kim '466 disclose an array substrate for a liquid crystal display device, comprising: a substrate 101; gate and data lines (113 and 123) crossing each other on the substrate; a gate insulator 117 on the gate line; a thin film transistor connected to the gate and data lines, the thin film transistor having a semiconductor layer 133, a first ohmic contact layers 135 (portion below drain electrode 131), a second ohmic contact layer 135 (portion below source electrode 121), and source and drain electrodes (121 and 131); a passivation layer pattern 137 on the data line and the source and drain electrodes and covering a crossing portion of the gate and data lines, the passivation layer pattern exposing a portion of a side surface of the drain electrode; and a pixel electrode 141 connected to the drain electrode. The difference between Kim'466 and the claimed invention is the semiconductor

layer and the ohmic contact layers having ends aligned with and directly below corresponding ends of the source electrode and drain electrodes. Figure 3I of Lyu discloses a thin film transistor with a semiconductor layer 137 and ohmic contact layers 139 having ends aligned with and directly below the corresponding ends of the source and drain electrodes. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kim'466 by using the layer alignment of Lyu for the purpose of simplifying the production process and reducing manufacturing costs.

In regards to claim 7, Figure 7 of Kim'466 discloses a storage capacitor including a first storage electrode 113, a portion of a gate insulation layer 117, and a second storage electrode 151, wherein the first storage electrode is formed of the same material as the gate electrode 111 (column 5, lines 30-35) and the second storage electrode is formed of the same electrode material as the source and drain electrodes (column 5, lines 54-57).

Claims 6 and 10-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim.

In regards to claims 6 and 12, Figures 4 and 8 of Kim disclose an array substrate for a liquid crystal display device, comprising: a substrate 100; gate and data lines (130a and 150) crossing each other on the substrate; a thin film transistor connected to the gate and data lines, the thin film transistor having a semiconductor layer 110, a plurality of ohmic contact layers (paragraph [0037]), and source and drain electrodes (150 and 170); a passivation layer pattern 160 on the data line and the thin film transistor, the passivation layer pattern exposing a portion of a side surfaces of the drain electrode; and a pixel electrode 7 connected to the drain electrode. Note that Kim discloses in paragraph [0037] that the source and drain electrodes are in ohmic

contact with the respective source and drain regions of the active layer 110, therefore it is considered that these source and drain regions are the ohmic contact layers. The difference The difference between Kim and the claimed invention is the semiconductor layer and the ohmic contact layers having ends aligned with and directly below corresponding ends of the source electrode and drain electrodes. Figure 3I of Lyu discloses a thin film transistor with a semiconductor layer 137 and ohmic contact layers 139 having ends aligned with and directly below the corresponding ends of the source and drain electrodes. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kim by using the layer alignment of Lyu for the purpose of simplifying the production process and reducing manufacturing costs.

In regards to claim 10, Figure 8 of Kim discloses a gate insulation film 120 over the gate line, wherein a portion of the pixel electrode is formed directly on the gate insulation film.

In regards to claims 11 and 14, Figure 8 of Kim discloses the passivation layer patter 160 further exposes a portion of a top surface of the drain electrode 170.

In regards to claim 13, Figure 8 of Kim discloses a portion of the pixel electrode is formed directly on the gate insulator.

Response to Arguments

Applicant's arguments filed September 11, 2003 have been fully considered but they are not persuasive.

In response to Applicant's arguments that "Akamatsu fails to disclose 'a gate insulation layer formed underneath the passivation layer, wherein the contact hole is defined through the passivation layer and the gate insulation layer'", as indicated in the above rejection, Figure 7A of Akamatsu clearly discloses claimed features.

Applicant's arguments regarding all other rejections are moot in light of the new grounds of rejection set forth above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Matthew C. Landau

Examiner

November 19, 2003